WHAT IS CLAIMED IS:

1. A method for detecting and attenuating grid artifacts in a digital radiographic image comprising;

providing an input digital radiographic image;

processing said input digital radiographic image with a detection algorithm based on 2-D dynamic correlation in both spatial and frequency domains to determine whether said input digital radiographic image has a grid artifacts; and

if it does detecting the grid orientation, frequency, and signal-to-noise ratio of said grid artifacts;

designing a frequency bandstop (notch) digital 1-D filter as a function of said grid frequency and attenuation level; and

suppressing said grid artifacts by further processing said input digital radiographic image with said designed filter to produce an output digital radiographic image of improved image quality.

2. The method of claim 1 wherein said processing includes consequent dynamic analyzing image profiles in two dimensions both in spatial and in frequency domains in a predefined square sub-region of the input digital radiographic image (window) in each of horizontal and vertical directions.

3. The method of claim 2 wherein said consequent dynamic analyzing includes calculating and analyzing auto-correlation (ACF) and cross-correlation (CCF) functions for 2 image profiles with predefined incremental step in said predefined window.

4. The method of claim 3 wherein said analyzing of ACF and CCF includes:

obtaining Fourier power spectra of ACF and CCF 1st derivatives;

averaging the obtained Fourier power spectra;

searching for the frequencies of the maxima in the right part of averaged Fourier spectra; and

checking that these frequencies of the maxima are the same values, within predefined accuracy.

5. The method of claim 4 wherein said dynamic analyzing includes tracking successful matches of found frequency values treated as detected grid artifacts.

6. The method of claim 4 wherein said detecting of grid frequency includes detecting a grid frequency and maximum magnitude in a current image profile Fourier spectrum within the bandwidth equal to the pre-defined accuracy at the found frequency for CCF.

7. The method of claim 4 wherein said detecting of grid signal-to-noise (SNR) ratio includes:

calculating a standard deviation of signal frequencies within the bandwidth equal to the predefined accuracy at the frequency of 0.25 of Nyquist;

calculating and accumulating current image profile SNR as a ratio of said standard deviation and said grid maximum magnitude; and

calculating SNR averaged by total number of profiles with detected grid artifacts.

8. The method of claim 4 wherein said detecting of grid frequency includes calculating the grid frequency from the frequencies of the maxima found in the right part of the CCF 1st derivative power spectrum, averaged over all image profiles that contain detected grid artifacts.

9. The method of claim 1 wherein said designing includes calculating notch filter coefficients.

10. The method of claim 9 wherein said notch filter coefficients calculating includes calculating finite impulse response notch filter coefficients.

11. The method of claim 10 wherein said finite impulse response notch filter coefficients calculating includes using a trigonometric trapezoid filter algorithm with Potter P310 smoothing window.

12. The method of claim 1 wherein said suppressing includes a pre-convolution procedure, a fast convolution procedure, and a post-convolution procedure.

13. The method of claim 12 wherein said pre-convolution and post-convolution procedures include using a spike effect elimination function and an edge effect elimination function.

14. The method of claim 13 wherein said spike effect elimination function includes using a spike detection algorithm:

retaining spike locations and values until convolution is completed substituting;

spike values with linear interpolated neighbor values; and

the optionally replacing the spike values to their origin locations after convolution.

15. The method of claim 13 wherein said edge effect elimination function includes: extending said image profile at both the ends to filter operator length by replicating first and last values at each end before said convolution; and

removing the extended image profile after said convolution.

16. A method for detecting grid artifacts in a digital radiographic image comprising:

providing an input digital radiographic image;

processing said input digital radiographic image with a detection algorithm based on 2-D dynamic correlation in both spatial and frequency

domains to determine whether said input digital radiographic images has grid artifacts.

17. The method of claim 16 wherein said processing detects parameters of detected grid artifacts, including, one or more of, orientation, line frequency, and SNR of said detected grid artifacts.

18. A method for detecting a pattern of lines in a digital image comprising:

providing an input digital image; and

processing said input digital image with a detection algorithm based on 2-D dynamic correlation in both spatial and frequency domains to determine whether said input digital image has a pattern of lines.

19. The method of claim 18 wherein said processing detects parameters including the orientation, line frequency and signal-to-noise ratio (SNR) of a detected pattern of lines.

20. The method of claim 19 including eliminating a detected pattern of lines by applying a frequency bandstop digital filter designed as a function of said detected parameters of said pattern of lines.